

PATENT

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicant: Franciscus R. Blom Conf.:  
Appl. No.: Continuation of 09/235,549 Group:  
Filed: February 20, 2001 Examiner:  
For: PIEZOELECTRIC ACTUATOR FOR INK JET  
PRINthead

PRELIMINARY RESPONSE

Assistant Commissioner for Patents  
Washington, DC 20231

February 20, 2001

Sir:

The following remarks are respectfully submitted in connection with the above-identified application.

REMARKS

Claims 1 to 3 and 8 were rejected by the Examiner in parent application serial number 09/235,549 under 35 U.S.C. § 102 as being anticipated by Japan (100). Also, claims 4-7, 9 and 10 were rejected by the Examiner under 35 U.S.C. § 103 as being unpatentable over Japan (100), Naka or the prior art in view of Uehara, Dibbern or Okumura.

The present invention is directed to a piezoelectric actuator for an ink jet printhead which comprises a body of piezoelectric

material having a bottom face through which the mechanical energy of the actuator is transferred to a receiving member, said body having an active part adjacent to the bottom face as well as an inactive part; a layered structure of alternating signal electrodes and common electrodes arranged in the active part in parallel with the bottom face, and separated by layers of the piezoelectric material; a layered structure of alternating auxiliary electrodes and common electrodes arranged in the inactive part in parallel with the bottom face and separated by layers of the piezoelectric material; at least one signal lead electrode formed on a first side face of said body and interconnecting the signal electrodes; a ground lead electrode formed on a second side face opposite to said first side face and interconnecting the common electrodes; and an auxiliary lead electrode interconnecting the auxiliary electrodes.

As the Examiner will note, claim 1 is based on Figures 1 and 3 of the present application, which clearly show that in the active portion each signal electrode (32) is neighbored by at least one common electrode (34) and each common electrode is neighbored by at least one signal electrode. In this manner, a true alternating sequence of different electrodes is provided. The same accounts for the inactive portion, wherein each electrode of one kind (auxiliary electrode (40) or common electrode (34)) is neighbored by at least one electrode of the other kind.

In the Japan (100) a piezoelectric actuator is disclosed wherein the active portion is provided with four successive signal electrodes (5a), which are electrodes of one kind. The top and side surface of this active portion is provided with a common external ground electrode (12), which is an electrode of another kind. From the corresponding figures it becomes apparent that the two middle electrodes (5a) are neighbored solely by electrodes of their own kind. This structure differs significantly from the structure presently recited in claim 1. The inactive portion as disclosed in the Japanese reference is provided with four dummy electrodes (6c), which are also electrodes of only one kind. The top surface of the inactive portion is provided with a common external ground (11). Here again, the two middle electrodes (6c) are neighbored solely by electrodes of their own kind. Accordingly, the reference relied upon by the Examiner does not teach a piezoelectric actuator with a layered structure of alternating signal electrodes and common electrodes in the active portion such that each electrode of one kind is neighbored by at least one electrode of the other kind, and a layered structure of alternating auxiliary electrodes and common electrodes in the inactive portion such that each electrode of one kind is neighbored by at least one electrode of the other kind. Accordingly, it is believed that the piezoelectric actuator of the present invention is clearly distinguishable over that referred to

in the Japanese reference relied upon by the Examiner. Because of the particular constitution of the actuator of the present invention, this actuator is highly limited in freedom of design when it is employed in an ink jet printer. It is the object of the present invention to mitigate this problem, and to this end, the actuator as defined by the present invention has been developed. Since it is believed that the actuator as presently recited in claim 1 is patentably distinct over the references relied upon by the Examiner, allowance of claim 1 of the present application is respectfully requested. Since all of the remaining claims of the present application depend from claim 1, for the same reason, it is believed that all of the dependent claims of the present application are also patentable over the prior art relied upon by the Examiner.

Accordingly, allowance of all of the claims of the present application are respectfully requested.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Joseph A. Kolasch (Reg. 22,463) at the telephone number of the undersigned below.

Docket No.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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By 

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